Role of Snails' Disease in the Biological Control of *Achatina fulica* Bowdich, 1822 in the Andamans

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A Leucodermia-like disease of the giant African snail was observed to cause heavy mortality in our laboratory culture in 1965 (Srivastava, 1966). Since then experiments have been in progress to see if it could be made use of to control field populations. Vago (1955) has studied 10 different diseases of several species of snails in France and has also reported the mortality of as many as 50000 snails in "snail parks." Mead (1959) is tempted to believe that diseases "successfully hold most snail populations in check and produce a major effect in population fluctuations." He has also predicted that in course of time a number of snails' diseases would be found and reported upon. However, enough data to show the definite effect of diseases on the populations of snails are lacking.

In the course of the survey of the giant African snail and its natural enemies on the Andaman Islands since 1965, some snails, dead and dying with disease, were observed in the laboratory culture as well as in the field population. The diseased snails were inactive, suspended and finally stopped feeding. This confirmed the existence of the disease in the snail on the Andamans. The diseased snails collected from the field as well as picked up from the laboratory culture were placed in a field cage of the size of 10′x10′x10′, overpopulated with normal snails and having an excess of moisture, the two requirements for the development of disease in snails. This resulted in mass mortality in the field cage, proving conclusively that the disease can spread through contact. Diseased snails were crushed and their aqueous extracts sprayed over healthy snails in the field cage to see if this technique would help in spreading the disease. This was repeated twice and the results are tabulated in Table 1.

From Table 1 it is clear that within about a week of the date of spraying the diseased snails' extract over the healthy ones, all the snails died. This method was then adopted to spread the disease in the field population of snails in three heavily infested localities; it was successful

Table 1

Field cage trials with diseased snail's extract spray

Sl. No.	Number of diseased snails crushed	Date of spraying	Date of observation	Total number of healthy snails introduced	Number of dead snails	Number of living snails	% mortality	Remarks
1	6	9 VI 1967	13 VI 1967	1650	1350	300	81.8	No mortality was observed in the snails kept under similar conditions except that they were not sprayed with diseased snail's extract
			16 VI 1967	0	220	80	73.3	
			18 VI 1967	0	80	0	100	
2	2	19 VI 1967	23 VI 1967	180	127	53	70.5	
			25 VI 1967	0	53	0	100	

Table 2

Field trials with diseased snails' extract spray

Sl. No.	Date of spraying	Date of observation	Locality	Result	Remarks
1.	21 VI 1967	23 VI 1967	Humphri Ganj	No mortality due to disease observed or reported	Soon after spraying it rained heavily on 21 VI 1967
		27 VI 1967	Humphri Ganj	No mortality observed or reported	On 23 VI 1967 it rained heavily throughout
		29 VI 1967	Humphri Ganj	No mortality observed or reported	
2.	27 VI 1967	29 VI 1967	Manglutan	Population of snails reported less	No rain soon after spraying on 27 VI 1967
		3 VII 1967	Manglutan	Heavy mortality, & foul smell emitted from dead snails	
3.	29 VI 1967	3 VII 1967	Maymyo	Population much less	No rain soon after spraying on 27 VI 1967

in spreading the disease in the field population of two of these localities (Table 2). At Humphriganj, spraying was followed by heavy showers which probably did not give a chance to the causative organism of the disease to become established there.

Mead (1956) has reported high incidence (35 to 68%) of disease in snails, but of low gastropod host specificity, meaning thereby that the disease of one species of snail may cause the disease in another species of snail. Boycott & Oldham (1938) have reported the disease of *Helix aspersa* Müller, 1776, to be contagious. Muma (1954) has reported a disease in the tree snail *Drymaeus dormani* (Binney, 1857) and considers it to be of "possible bacterial origin." The reproductive potential of the introduced predators is very low, which is to some extent a disadvantage. Whereas in the case of disease it is not so. Mead (1955) says that the reproductive capacity of disease is so great (unlike that of predators) that it can produce a catastrophic effect quickly upon the snail population. Present investigations go to show that the disease can be a potential agent in the control of snails; and one way of spreading disease in the field population of snails is to spray aqueous extract of diseased snails over the field population.

SUMMARY

Disease of the giant African snail has now been detected in the culture as well as in the field population of this species on the Andamans.

Aqueous extract of diseased snails, when sprayed over healthy populations of the giant African snail, is capable of spreading the disease in them and finally causing mortality in about a week.

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